

DRAFT

HEALTH ADVISORY

SAFE EATING GUIDELINES FOR FISH FROM THE LOWER COSUMNES AND LOWER MOKELUMNE RIVERS (SACRAMENTO AND SAN JOAQUIN COUNTIES)

April 2006

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EXECUTIVE SUMMARY

Mercury levels were evaluated in edible tissue of fish caught from the lower Cosumnes and Mokelumne rivers in Sacramento and San Joaquin counties, respectively, areas possibly affected by historic gold mining. Fish were collected and analyzed through the Toxic Substances Monitoring Program (TSMP), the CALFED Mercury Project, and the University of California at Davis (UCD). A number of chlorinated hydrocarbon contaminants, including DDTs and PCBs, were also measured in fish and obtained through the Delta-San Joaquin Study and the National Water Quality Assessment Program. Data were evaluated by the Office of Environmental Health Hazard Assessment (OEHHA) in an effort to determine whether there may be potential adverse health effects associated with the consumption of sport fish from these water bodies.

Almost all fish contain detectible levels of mercury, more than 95 percent of which occurs as methylmercury, a highly toxic form of the element. Consumption of fish is the major route of exposure to methylmercury in the United States. The critical target of methylmercury toxicity is the nervous system, particularly in developing organisms such as the fetus and young children. Significant methylmercury toxicity can occur to the fetus during pregnancy even in the absence of symptoms in the mother. In 1985, the United States Environmental Protection Agency (U.S. EPA) set a reference dose (RfD, that is the daily exposure likely to be without significant risk of deleterious effects during a lifetime) for methylmercury of 3×10^{-4} mg/kg-day, based on central nervous system effects (ataxia and paresthesias) in adults. In 1995, and confirmed in 2001, this RfD was lowered to 1×10^{-4} mg/kg-day, based on developmental neurologic abnormalities in infants exposed *in utero*, using the Iraqi and Faroe Island data, respectively. OEHHA finds convincing evidence that the fetus is more sensitive than adults to the neurotoxic effects of mercury, but also recognizes that fish can play an important role in a healthy diet, particularly when it replaces other higher fat sources of protein. Numerous human and animal studies have shown that fish oils have beneficial cardiovascular and neurological effects. Because it is important to protect the most sensitive population without unduly restricting fish consumption in others, OEHHA chooses to use both the current and previous U.S. EPA reference doses for two distinct population groups. In these guidelines, the current RfD based on effects in infants will be used for women of childbearing age and children aged 17 and younger. The previous RfD, based on effects in adults, will be used for women beyond their childbearing years and men.

In order to provide safe eating guidelines for various fish species, contaminant concentrations in fish from a water body are compared to OEHHA guidance tissue levels (GTLs) for those chemicals. GTLs are used to provide meal consumption advice to prevent consumers from being exposed to more than the average daily reference dose for non-carcinogens or to a risk level greater than 1×10^{-4} for carcinogens. One or more data evaluation approaches are then used to develop site-specific (water body) consumption advice. Safe eating guidelines identify those fish species with higher contaminant levels whose consumption should be restricted (see the “Eat in Moderation” table) or avoided altogether (see the “Avoid” table), as well as those low-contaminant fish that may be consumed frequently as part of a healthy diet (see the “Enjoy” table). A statistically representative sample size was available to provide safe eating guidelines for the Cosumnes River for largemouth bass, red swamp crayfish, and Asiatic clams. For the Mokelumne River, sample size was sufficient to develop safe eating guidelines for largemouth bass, bluegill, white catfish, signal crayfish, and Asiatic clams. Supporting data, such as mercury

concentration for another species at a similar trophic level or for the same species in a nearby tributary, were used to develop additional consumption guidelines for other sport fish or shellfish, as appropriate.

All individuals, especially women of childbearing age and children aged 17 and younger, are advised to follow the safe eating guidelines to ensure that methylmercury ingestion does not exceed the reference dose. To help sport fish consumers achieve this goal, OEHHA has developed guidelines for all fish and shellfish species caught in the lower Cosumnes and lower Mokelumne rivers. Meal sizes should be adjusted to body weight as described in the safe eating guidelines table.

For general advice on how to limit your exposure to chemical contaminants in sport fish (e.g., eating smaller fish of legal size), as well as a fact sheet on methylmercury in sport fish, see the California Sport Fish Consumption Advisories (<http://www.oehha.ca.gov/fish.html>) and Appendices 1 and 2. Advice for other California water bodies can be found online at: http://www.oehha.ca.gov/fish/so_cal/index.html. It should be noted that, unlike the case for many chlorinated hydrocarbon contaminants, various cooking and cleaning techniques will not reduce the methylmercury content of fish.

SAFE EATING GUIDELINES

FISH AND SHELLFISH CONSUMPTION FROM THE LOWER COSUMNES RIVER AND NEARBY CREEKS AND SLOUGHS

Fish and shellfish are nutritious and should be part of a healthy, balanced diet. It is important, however, to choose your fish wisely. The American Heart Association recommends healthy adults eat at least two meals of fish a week. OEHHA recommends that you choose fish to eat that are low in mercury such as those in the “Enjoy” category. Because many types of fish from the lower Cosumnes River contain higher levels of mercury, OEHHA provides the recommendations below that you can follow to reduce the risks from exposure to methylmercury in fish.



**Women of childbearing age, pregnant or breastfeeding women,
and children 17 years and under**

AVOID DO NOT EAT MORE THAN THE AMOUNT LISTED BELOW:	
DO NOT EAT	Largemouth, smallmouth or spotted bass; or Sacramento pikeminnow
NO MORE THAN 1 MEAL A MONTH	All other fish or crayfish species*

*Asiatic clams may be eaten up to 3 times a week



Women beyond childbearing age and men

ENJOY UP TO 2 MEALS A WEEK
Bluegill or redear sunfish or Asiatic clams
EAT IN MODERATION NO MORE THAN 1 MEAL A WEEK
Crayfish or Sacramento sucker or white catfish
AVOID NO MORE THAN 1 MEAL A MONTH
Largemouth, smallmouth or spotted bass; or Sacramento pikeminnow

- **EVERYONE FOLLOW THE STRIPED BASS ADVISORY FOR DELTA WATER BODIES.** WOMEN OF CHILDBEARING AGE AND CHILDREN 17 YEARS AND YOUNGER: no more than one meal per month and none over 27 inches. WOMEN BEYOND CHILDBEARING AGE AND MEN: no more than two meals per month and none over 35 inches.
- **CONTACT WITH THE WATER IS SAFE.**
- **EAT SMALLER FISH OF LEGAL SIZE.** Fish build up mercury in their bodies as they grow.
- **MEAL SIZE DEPENDS ON BODY WEIGHT.** Meals are based on a 160 lb adult eating 8 ounces of fish (6 ounces after cooking)—about the size of two decks of cards. If you weigh less than 160 lbs, eat smaller portions of fish. Serve smaller meals to children.
- **DO NOT EAT MORE THAN ONE OF THE LISTED FISH SPECIES DURING THE SAME TIME PERIOD** unless you are only eating from the Enjoy (green) category. If you eat fish from one place, following the advisory, avoid eating fish from other sources during the same time period.
- **CONSIDER THE FISH YOU BUY FROM STORES AND RESTAURANTS.** Women of childbearing age and children can safely eat up to 2 meals a week of a variety of fish purchased from a store or restaurant, **OR** use this guide for eating fish caught from this water body. In a week when you eat 2 meals of fish purchased from stores or restaurants, avoid eating fish caught from a local water body. Commercial fish such as shrimp, king crab, scallops, farmed catfish, wild ocean salmon, oysters, tilapia, flounder, and sole generally contain some of the lowest levels of mercury. Women of childbearing age and children should not eat SHARK OR SWORDFISH.
- **FISH FROM OTHER WATER BODIES MAY ALSO CONTAIN MERCURY.** Not all water bodies in California have been tested. With the exception of ocean or river-run salmon and steelhead, which generally contain low levels of contaminants, fish caught from places without an advisory should be eaten in limited amounts.

SAFE EATING GUIDELINES

FISH AND SHELLFISH CONSUMPTION FROM THE LOWER MOKELUMNE RIVER AND NEARBY CREEKS AND SLOUGHS

Fish and shellfish are nutritious and should be part of a healthy, balanced diet. It is important, however, to choose your fish wisely. The American Heart Association recommends healthy adults eat at least two meals of fish a week. OEHHA recommends that you choose fish to eat that are low in mercury such as those in the “Enjoy” category. Because many types of fish from the lower Mokelumne River contain higher levels of mercury, OEHHA provides the recommendations below that you can follow to reduce the risks from exposure to methylmercury in fish.



Women of childbearing age, pregnant or breastfeeding women, and children 17 years and under

EAT IN MODERATION NO MORE THAN 1 MEAL A WEEK
Crayfish*
AVOID DO NOT EAT MORE THAN 1 MEAL A MONTH
All fish species

*Asiatic clams may be eaten up to 3 times a week



Women beyond childbearing age and men

ENJOY UP TO 2 MEALS A WEEK
Crayfish or bluegill or Sacramento sucker or white catfish or Asiatic clams*
AVOID NO MORE THAN 1 MEAL A MONTH
Largemouth, smallmouth or spotted bass; or Sacramento pikeminnow

*Asiatic clams may be eaten up to 3 times a week

- **EVERYONE FOLLOW THE STRIPED BASS ADVISORY FOR DELTA WATER BODIES.** WOMEN OF CHILDBEARING AGE AND CHILDREN 17 YEARS AND YOUNGER: no more than one meal per month and none over 27 inches. WOMEN BEYOND CHILDBEARING AGE AND MEN: no more than two meals per month and none over 35 inches.
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LOWER COSUMNES AND LOWER MOKELUMNE SPORT FISH

Largemouth Bass (*Micropterus salmoides*)



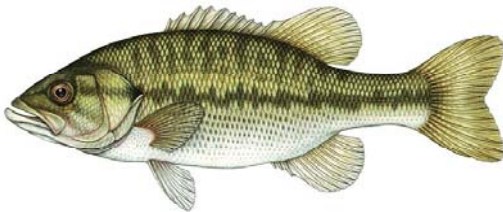
Duane Raver, USFWS

Smallmouth Bass (*Micropterus dolomieu*)



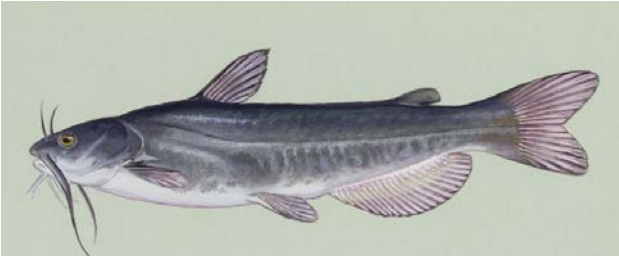
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Spotted Bass (*Micropterus punctulatus*)



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White catfish (*Ameiurus catus*)



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Sacramento Pikeminnow (*Ptychocheilus grandis*)



Rene' Reyes, USBR

Sacramento Sucker (*Catostomus occidentalis*)



Rene' Reyes, USBR

Bluegill (*Lepomis macrochirus*)



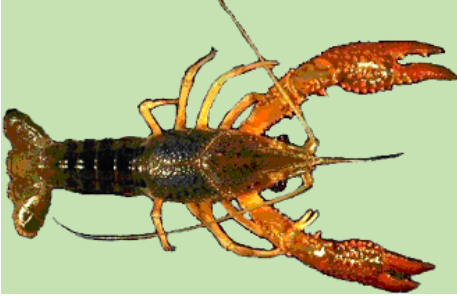
Duane Raver, USFWS

Redear Sunfish (*Lepomis microlophus*)



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Red swamp crayfish (*Procambarus clarkii*)



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Signal crayfish (*Pacifastacus leniusculus*)



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Showing variation:



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Note: Pictures are not to scale